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Publication date:
2010

Document version
Early version, also known as pre-print

Prevalence of Intestinal parasites, Anaemia, Malaria Parasitaemia, and Nutritional Status among Children under five years at the Lamarame Health Post.

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Introduction

A cross sectional study was undertaken in January 2010 at the Lamarame health post (in Senegal) as part of a baseline assessment of an operational research aiming to identify appropriate mechanism for an integrated community-based malaria control strategy, including effective case management using rapid diagnostic test , ACTs and prevention through IPTc by community health workers .

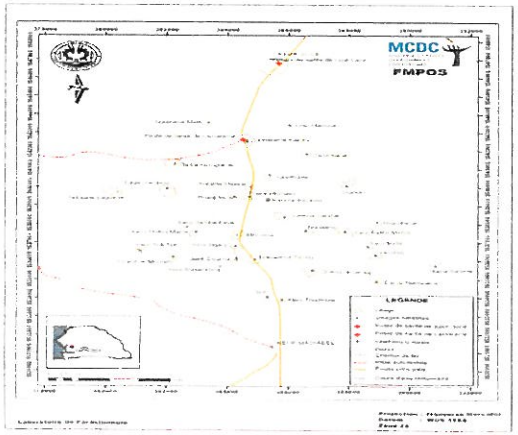
Objectives

- To assess the prevalence of malaria parasitaemia, intestinal parasites (IP), anaemia and malnutrition among children <5 years;
- To explore the relationship between malaria, anaemia, intestinal parasite and malnutrition.

Methods

A cross sectional household survey was done using a two level random cluster sampling technique with a total of 30 clusters randomly selected based on probability proportional to population size in the villages.

Each eligible child was examined by a physician prior to a biological assessment which included blood and stool samples. Children were weighed using Seca scales. Weight- for -age Z-score was used to denote underweight while height for age Z.score was used as an indicator of stunting. The Z-scores were calculated based on the median values of the National Centre for Health Statistics (NCHS) reference population, United States. The study was approved by the Senegalese national ethical committee.



Results

Malaria parasitaemia was 1.5%, moderate and severe anaemia represented 53.4% and 12.5% respectively; 26.2% of children were found with at least one intestinal parasite. Stunting and underweight

Table 1: Prevalence of malaria, anemia, intestinal parasites and undernutrition among children under 5years at Lamarame health post. (n=736)

Variables	Number	Percentage	CI95%
Malaria parasite			
Yes	11	1.5	[0.7 -2.6]
No	721	98	[90.9 – 100]
Missing	4	0.5	[0.1 – 1.4]
Anemia			
Mean haemoglobin	736	10.1 ± 1.9	
Moderate anemia (Hb<11)	393	53.4	[48.2 - 58.9]
Severe Anemia (Hb<8)	92	12.5	[10 – 15.3]
Intestinal parasite prevalence			
Children with at least one parasite	193	26.2	[22.6 – 30.2]
Parasite species			
Giardia intestinalis	115	15.6	[12.9 – 18.7]
Entameaba coli	80	10.9	[8.6 – 13.5]
Hymenolepis nana	14	1.9	[1 – 3.2]
Ascaris lumbricoides	3	0.4	[0.08 – 1.2]
Enterobius vermicularis	3	0.4	[0.08 – 1.2]
Trichuris trichiura	1	0.1	[0.003 – 0.7]
Undernutrition			
Stunting (HAZ <-2SD)	161	22	[18.6 – 25.5]
Underweight (WAZ <-SD)	120	16.3	[13.5 – 19.5]

Anaemia (Hb <11g/dl) was significantly associated with age range from 12 to 23 months , malaria parasite , birth order higher than 3 and residence zone.

Table 2: Factors associated with anemia among children under five at Lamarame health post

		Anemia (Hb<11g/dl)	
Variables	Number (%)	aOR* (95% CI)	p value
Age (months)			
< 12	19 (45.2)	1	
12 – 23	199 (83.3)	4.0 [1.8-8.6]	0.000
24 – 35	136 (69)	1.7 [0.8-3.7]	0.13
36 – 47	83 (60.6)	1.2 [0.5-2.6]	0.64
48 – 60	54(44.6)	0.6 [0.3-1.4]	0.31
Gender			
Male	264(67.2)	1	
Female	227(66.2)	0.8 [0.6-1.2]	0.37
Birth order			
[1-3]	254(64.6)	1	
[4-5]	235(69.1)	1.8 [1.1-3.5]	0.04
Number of children within household			
[1-3]	213(68.9)	1	
[4-5]	133(61.6)	0.5 [0.3-0.8]	0.01
>5	137(67.8)	0.6[0.3-1.2]	0.14
Malaria parasite			
No	479(66.4)	1	
Yes	10(90.9)	6.3 [1.5-53.5]	0.03
Intestinal parasite			
No	369(68.7)	1	
Charcha intestinalis	73(63.5)	0.9[0.6-1.4]	0.66
Entameba coli	49(61.2)	1.1[0.6-1.9]	0.6
Hymenolepis nana	10(71.4)	2 [0.5-7.3]	0.28
Enterobius vermicularis	1(33.3)	0.2 [0.02-2.7]	0.25
Ascaris lumbricoides	1(33.3)	0.2 [0.01-2.7]	0.23
Residance zone			
Health post	55(47.4)	1	
Other villages	436(70.3)	2.4[1.5-3.8]	0.000

*Adjusted OR- Hosmar-Lameshow Gooness of fit test Chi² (8df)=5.49 p=0.70

Stunting was significantly associated with moderate anaemia, severe anaemia , residence zone , birth order >3.

Table 3: Factors associated with stunting among children under five years at Lamarame health post

		Stunting (HAZ)	
Variables	Number (%)	aOR* (95% CI)	p value
Age (months)			
< 12	1 (2.4)	1	
12 – 23	64 (26.8)	7.4 [1 – 57.3]	0.05
24 – 35	49 (24.9)	7.5 [1 – 58.1]	0.05
36 – 47	29 (21.1)	6.6 [0.8 – 52.3]	0.07
48 – 60	18 (14.9)	5 [0.6 – 41]	0.13
Gender			
Male	88 (22.4)	1	
Female	73 (21.3)	0.9 [0.6 – 1.4]	0.82
Birth order			
[1-3]	82 (20.8)	1	
[4-5]	79 (23.2)	2.9 [1.3 – 6.6]	0.01
Number of children within household			
[1-3]	75 (24.2)	1	
[4-5]	43 (19.9)	0.4 [0.2 – 0.8]	0.01
>5	42 (20.8)	0.3 [0.1 – 0.7]	0.01
Malaria parasite			
No	157 (21.8)	1	
Yes	3 (27.3)	1.2 [0.3 – 5]	0.75
Intestinal parasite			
No	123 (22.9)	1	
Giardia intestinalis	21 (18.3)	0.9 [0.5 – 1.6]	0.73
Entameba coli	17 (21.2)	1.2 [0.7 – 2.3]	0.45
Hymenolepis nana	3 (21.4)	1.3 [0.3 – 5.4]	0.69
Enterobius vermicularis	00	-	
Ascaris lumbricoides	00	-	
Residance zone			
Health post	7 (6)	1	
Other villages	154 (24.8)	3.6 [1.6 – 8.1]	0.002
Anemia			
No	29 (11.8)	1	
Moderate anemia(Hb<11g/dl)	93 (23.6)	1.7 [1.1 – 2.8]	0.02
Severe anemia (Hb<8 g/dl)	39 (39.8)	3.5 [1.9 – 6.4]	0.000

*Adjusted Odds ratio Goodness of fit test Hosmer-Lemeshow Chi² (8df) =7.45, p=0.48

Conclusion

Anemia and malnutrition are frequent in the area of Lamarame, as well as intestinal parasitic infections with a higher prevalence of *Giardia intestinalis*. Mass administration of albendazole which may eliminate both protozoan and heminths, could be considered in this locality, in order to reduce the occurrence of protozoan infections which have been neglected by several health programmes.

Acknowlegment

This study was supported by the Malaria Capacity Development Consortium (MCDC).

Thanks are also for the children for their participation and cooperation in this study.

Supplement to
THE AMERICAN JOURNAL OF
Tropical Medicine and Hygiene
Official Journal of the American Society of Tropical Medicine and Hygiene
Volume 83 November 2010 Number 5 Supplement

Abstract Book

American Society of Tropical Medicine and Hygiene

59th Annual Meeting

59
ASTMH fifty-ninth ANNUAL MEETING

November 3–7, 2010
Atlanta Marriott Marquis
Hilton Atlanta
Atlanta, Georgia, USA

Supplement to

The American Journal of
Tropical Medicine and Hygiene